Having described the invention, the following is claimed:

1. A method of establishing communication with the interior of a vessel in a human body, said method comprising the steps of piercing a side wall of the vessel in the human body with a leading end portion of a cannula, thereafter, moving the leading end portion of the cannula into the vessel through an opening formed during performance of said step of piercing the side wall of the vessel with the leading end portion of the cannula, and, thereafter, expanding the leading end portion of the cannula while the leading end portion of the cannula is disposed in the vessel.

2. A method as set forth in claim 1 further including the step of expanding the vessel during performance of said step of expanding the cannula.

3. A method as set forth in claim 1 wherein said step of expanding the leading end portion of the cannula includes inserting a tubular member into the cannula.

4. A method as set forth in claim 1 wherein said step of expanding the leading end portion of the cannula includes conducting fluid pressure into the cannula and

applying fluid pressure against an inner side surface of the leading end portion of the cannula.

5. A method as set forth in claim 1 wherein said step of expanding the leading end portion of the cannula is performed with the leading end portion of the cannula extending through the opening formed in the vessel during performance of said step of piercing the outer side wall of the vessel, said step of expanding the leading end portion of the cannula includes increasing the size of the opening in the side wall of the vessel.

6. A method as set forth in claim 1 further including the step of conducting fluid through the cannula into the vessel after performing said step of expanding the leading end portion of the cannula.

7. A method as set forth in claim 1 further including the step of piercing body tissue adjacent the side wall of vessel with the leading end portion of the cannula prior to performance of said step of piercing the side wall of the vessel with the cannula.

8. A method as set forth in claim 1 further including the step of piercing skin of the human body containing the vessel with the leading end portion of the cannula prior to performance of said step of piercing the

side wall of the vessel with the leading end portion of the cannula.

9. A method as set forth in claim 1 wherein said step of moving the leading end portion of the cannula into the vessel includes moving the leading end portion of the cannula axially along a blood vessel.

10. A method as set forth in claim 1 wherein said step of expanding the leading end portion of the cannula includes sliding a tubular member along side surfaces of a plurality of wires in the leading end portion of the cannula.

11. A method as set forth in claim 1 wherein said step of piercing the side wall of a vessel in a human body with a leading end portion of a cannula includes piercing an outer side surface of the side wall of the vessel with a wire which forms a portion of the leading end portion of the cannula.

12. A method as set forth in claim 1 wherein said step of piercing the side wall of a vessel in a human body with a leading end portion of a cannula includes initiating the formation of an opening in an outer side surface of the vessel by piercing the outer side surface of the vessel

with a wire which forms a portion of the leading end portion of the cannula.

13. A method as set forth in claim 1 wherein said step of piercing an outer side wall of the vessel includes engaging an imperforate area on the side wall of the vessel with a pointed end portion of a tubular sheath formed of an elastic material, thereafter, moving the pointed end portion of the sheath formed of an elastic material through the side wall of the vessel to form an opening in the side wall of the vessel, and moving the pointed end portion of the sheath through the opening in the side wall of the vessel.

14. A method as set forth in claim 13 wherein said step of expanding the leading end portion of the cannula includes resiliently expanding the sheath in such a manner as to increase the cross sectional size of the sheath as viewed in a plane extending perpendicular to a longitudinal central axis of the tubular sheath and increasing the size of the opening formed in the side wall of the vessel.

15. A method as set froth in claim 1 wherein the cannula includes a tubular sheath formed of an elastic material which is resiliently deflectable and a plurality of wires which extend along an inner side of the sheath, said step of piercing the side wall of the vessel including

transmitting an axial force through the wires and the sheath to the side wall of the vessel.

16. A method as set forth in claim 15 wherein said step of expanding the leading end portion of the cannula includes resiliently stretching the material of the sheath and increasing spacing between longitudinally extending side surface areas on the wires as the material of the sheath is stretched.

17. A method as set forth in claim 1 wherein the vessel has a tubular configuration, said step of expanding the leading end portion of the cannula while the leading end portion of the cannula is in the vessel includes pressing an outer side surface of the cannula against an inner side surface of the tubular vessel, increasing the size of the outer side surface of the cannula, and increasing the size of the inner side surface of the tubular vessel under the influence of pressure applied against the inner side surface of the vessel by the outer side surface of the cannula.

18. A method as set forth in claim 1 wherein the leading end portion of the cannula includes a plurality of spaced apart, non-intersecting longitudinally extending wires enclosed by an expandable sheath, said step of expanding the leading end portion of the cannula includes

inserting a member into the leading end portion of the cannula, and utilizing the wires to hold longitudinally extending portions of an inner side surface of the sheath spaced apart from an outer side surface of the member during insertion of the member into the sheath.

19. A method as set forth in claim 18 wherein said step of inserting a member into the leading end portion of the cannula includes expanding the sheath under the influence of force transmitted from the outer side surface of the member through the wires to the sheath.

20. A method as set forth in claim 20 wherein the wires are disposed in an array having a first cross sectional area prior to insertion of the member into the leading end portion of the cannula, said step of inserting the member into the leading end portion of the cannula includes increasing the cross sectional area of the array of wires from the first cross sectional area to a second cross sectional area which is greater than the first cross sectional area.

21. A method as set forth in claim 1 wherein said step of expanding the leading end portion of the cannula includes inserting a first longitudinally extending member into the leading end portion of the cannula, and, thereafter, inserting a second longitudinally extending

member having a cross sectional area which is greater than a cross sectional area of the first member into the leading end portion of the cannula.

22. A method as set forth in claim 21 wherein the second member is tubular, said method further including conducting fluid into the vessel through the second member and the leading end portion of the cannula.

23. A method as set forth in claim 21 wherein said step of inserting a first member into the leading end portion of the cannula includes sliding the first member along longitudinally extending outer side surface areas on a plurality of wires disposed in the leading end portion of the cannula, said step of inserting the second member into the leading end portion of the cannula includes sliding the second member along surfaces of the plurality of wires and moving the plurality of wires out of engagement with the first member.

24. A method as set forth in claim 23 wherein said step of moving the plurality of wires out of engagement with the first member is performed during performance of said step of sliding the second member along surfaces of the plurality of wires.

25. A method as set forth in claim 1 wherein the vessel is a tubular vessel having a longitudinal central axis and the leading end portion of the cannula has an oval configuration as viewed in a plane extending perpendicular to a longitudinal central axis of the cannula, said step of piercing a side wall of the vessel being performed with a major axis of the oval cross section of the cannula extending along the longitudinal axis of the tubular vessel and a minor axis of the oval cross section of the cannula extending transverse to the longitudinal axis of the tubular vessel.

26. A method of establishing a flow of fluid into a longitudinally extending blood vessel in a human body, said method comprising the steps of inserting a leading end portion of a longitudinally extending tubular cannula into the blood vessel while the leading end portion of the cannula has a first cross sectional size as viewed in a plane extending perpendicular to a longitudinal central axis of the cannula, thereafter, increasing the cross sectional size of the leading end portion of the cannula from the first cross sectional size to a second cross sectional size which is greater than the first cross sectional size, increasing the cross sectional size of the blood vessel as viewed in a plane extending perpendicular to a longitudinal central axis of the blood vessel, said step of increasing the cross sectional size of the blood

vessel includes pressing an outer side surface of the leading end portion of the cannula against an inner side surface of the blood vessel while increasing the cross sectional size of the leading end portion of the cannula from the first cross sectional size to the second cross sectional size, and thereafter, conducting a flow of fluid through the cannula into the blood vessel while the leading end portion of the cannula has a cross sectional size which is greater than the first cross sectional size.

27. A method as set forth in claim 26 wherein said step of inserting a leading end portion of the cannula into the blood vessel while the leading end portion of the cannula has the first cross sectional size includes piercing an imperforate outer side surface area on the blood vessel with the leading end portion of the cannula.

28. A method as set forth in claim 26 further including reducing the cross sectional size of the leading end portion of the cannula after performing said step of conducting a flow of fluid through the cannula into the blood vessel and while the leading end portion of the cannula is disposed in the blood vessel, and, thereafter, removing the leading end portion of the cannula from the blood vessel.

29. A method as set forth in claim 26 wherein said step of increasing the cross sectional size of the leading end portion of the cannula from the first cross sectional size to a second cross sectional size includes inserting a tubular member into the leading end portion of the cannula, said step of conducting a flow of fluid through the cannula into the blood vessel includes conducting the flow of fluid through the tubular member.

30. A method as set forth in claim 26 wherein said step of increasing the cross sectional size of the leading end portion of the cannula from the first cross sectional size to a second cross sectional size includes applying fluid pressure against an inner side surface of the leading end portion of the cannula.

31. A method as set forth in claim 26 wherein said step of increasing the cross sectional size of the leading end portion of the cannula from the first cross sectional size to the second cross sectional size is performed with the leading end portion of the cannula extending through an opening in a side wall of the blood vessel and includes increasing the size of the opening in the side wall of the blood vessel.

32. A method as set forth in claim 26 wherein said step of inserting a leading end portion of the cannula into

the blood vessel while the leading end portion of the cannula has the first cross sectional size includes piercing an imperforate area of skin adjacent to the blood vessel with the leading end portion of the cannula to form an opening in the skin and piercing an imperforate outer side surface area on the blood vessel with the leading end portion of the cannula to form an opening in the side wall of the blood vessel.

33. A method as set forth in claim 32 wherein said step of increasing the cross sectional size of the leading end portion of the cannula from the first cross sectional size to the second cross sectional size includes increasing the size of the opening in the skin and increasing the size of the opening in the side wall of the blood vessel.

34. A method as set forth in claim 26 wherein said step of increasing the cross sectional size of the leading end portion of the cannula from the first cross sectional size to a second cross sectional size includes sliding a member along side surfaces of a plurality of wires in the leading end portion of the cannula.

35. A method as set forth in claim 26 wherein said step of inserting a leading end portion of the cannula into the blood vessel while the leading end portion of the cannula has a first cross sectional size includes piercing

an imperforate outer side surface area of a side wall of the blood vessel with a wire which forms a portion of the leading end portion of the cannula.

36. A method as set forth in claim 26 wherein the leading end portion of the cannula includes a tubular sheath formed of an elastic material and a plurality of wires which extend along an inner side of the sheath, said step of increasing the cross sectional size of the cannula from the first cross sectional size to a second cross sectional size includes resiliently stretching the material of the sheath and increasing spacing between longitudinally extending side surface areas on the wires as the material of the sheath is stretched.

37. A method as set forth in claim 26 wherein the leading end portion of the cannula includes a plurality of spaced apart, non-intersecting wires enclosed by an expandable sheath, said step of increasing the cross sectional size of the leading end portion of the cannula from the first cross sectional size to a second cross sectional size includes inserting a member into the leading end portion of the cannula, and utilizing the wires to hold longitudinally extending portions of an inner side surface of the sheath spaced apart from an outer side surface of the member during insertion of the member into the sheath.

38. A method as set forth in claim 26 wherein the leading end portion of the cannula has an oval cross sectional configuration as viewed in a plane extending perpendicular to a longitudinal central axis of the cannula, said step of inserting a leading end portion of the cannula into the blood vessel being performed with a major axis of the oval cross section of the cannula extending along a longitudinal axis of the blood vessel and a minor axis of the oval cross section of the cannula extending transverse to the longitudinal axis of the blood vessel.

39. A method comprising the steps of inserting a cannula having a sheath which encloses a plurality of longitudinally extending wires into a patient's body, and thereafter, inserting a member into the cannula utilizing the wires to hold longitudinally extending portions of an inner side surface of the sheath spaced apart from an outer side surface of the member during insertion of the member into the cannula, said step of inserting a cannula into a patient's body including initiating the formation of an opening in the patient's body tissue by piercing the patient's body tissue with a leading end of at least one of the wires.

40. A method as set forth in claim 39 wherein said step of initiating the formation of an opening in the

patient's body tissue further includes pressing a pointed end of the sheath and the leading end of the one wire against an imperforate surface area on the patient's body tissue.

41. A method as set forth in claim 39 wherein said step of inserting a cannula into a patient's body further includes engaging the patient's body tissue with a leading end of each of the longitudinally extending wires enclosed by the sheath.

42. A method as set forth in claim 41 wherein said step of inserting a cannula into a patient's body further includes engaging the patient's body tissue with portions of the sheath disposed between the leading ends of the wires.

43. A method as set forth in claim 39 wherein the one wire projects outward from a leading end of the sheath, said step of piercing the patient's body with a leading end of at least one of the wires includes engaging the patient's body tissue with a portion of the one wire which projects outward from the leading end of the sheath.

44. A method as set forth in claim 39 wherein said step of inserting the member into the cannula includes expanding the sheath under the influence of force

transmitted from the member to the sheath through the wires.

45. A method as set forth in claim 39 further including the steps of increasing the size of the opening formed in the patient's body tissue by pressing an outer side surface of the sheath against edge portions of the opening.

46. A method as set forth in claim 39 wherein the cannula has an oval cross sectional configuration as viewed in a plane extending perpendicular to a longitudinal central axis of the cannula, said step of inserting a cannula into a patient's body includes inserting the cannula into a vessel having a longitudinally extending central axis, said step of initiating the formation of an opening in the patient's body being performed with a major axis of the oval cross section of the cannula in a plane containing the longitudinal central axis of the vessel.

47. A method comprising the steps of inserting a cannula having a sheath which encloses a plurality of longitudinally extending wires into a patient's body, said step of inserting a cannula into a patient's body including pressing a leading end of the sheath against the patient's body tissue, and pressing a leading end of each of the wires against the patient's body tissue.

48. A method as set forth in claim 47 wherein said step of inserting the cannula into the patient's body further includes severing body tissue with the leading end of the sheath at locations between leading ends of the wires.

49. A method as set forth in claim 47 wherein the leading end of the wires have a pointed configuration, said step of inserting the cannula into the patient's body includes piercing the patient's body tissue with the pointed ends of the wires.

50. A method as set forth in claim 49 wherein said step of inserting the cannula into the patient's body further includes severing the patient's body tissue with the leading end of the sheath at locations between the pointed ends of the wires.

51. A method as set forth in claim 47 further including expanding the sheath after inserting the cannula into a patient's body, said step of expanding the sheath includes increasing spacing between wires of the plurality of longitudinally extending wires.

52. A method as set forth in claim 47 further including conducting fluid pressure into the sheath and expanding the sheath under the influence of the fluid

pressure in the sheath after having performed said step of inserting the cannula into a patient's body.

53. A method comprising the steps of inserting a cannula having a longitudinally extending elastic sheath into a patient's body, and, thereafter elastically expanding the sheath throughout the length of the portion of the sheath disposed in the patient's body, said step of expanding the sheath throughout the length of the portion of the sheath disposed in the patient's body includes conducting fluid pressure into the sheath and expanding the sheath under the influence of fluid pressure applied against an inner side surface of the sheath.

54. A method as set forth in claim 53 wherein said step of inserting the cannula into the patient's body includes piercing an imperforate surface area on the skin of the patient's body with a leading end of the cannula to form an opening in the skin, said step of expanding the sheath includes expanding a portion of the sheath which extends through the opening in the skin on the patient's body under the influence of fluid pressure applied against the inner side surface of the sheath.

55. A method as set forth in claim 53 wherein said step of inserting the cannula into the patient's body includes piercing an imperforate surface area on the skin

of the patient's body with a leading end of the cannula to form an opening in the shin, thereafter, piercing an imperforate surface area on a side wall of a blood vessel in the patient's body with the leading end of the cannula to form an opening in the side wall of the blood vessel, and moving the cannula through the opening in the side wall of the blood vessel into the blood vessel, said step of expanding the sheath of the cannula includes expanding a portion of the sheath extending through the opening in the side wall of the blood vessel to increase the size of the opening in the side wall of the blood vessel and expanding a portion of the sheath extending through the opening in the skin to increase the size of the opening in the skin.

56. A method as set forth in claim 55 wherein the sheath of the cannula encloses a plurality of longitudinally extending wires, said step of piercing an imperforate surface area on the skin of the patient's body includes pressing a leading end of the sheath and a leading end of each of the wires against the skin on the patient's body, said step of piercing an imperforate surface area on the side wall of the blood vessel includes pressing the leading end of the sheath and the leading end of each of the wires against the side wall of the blood vessel.